Appl. No.: 10/649,716
Amdt. dated 01/11/2006
Reply to Office action of 10/18/2005

Amendments to the Claims:

Claims 1-31 Canceled.

32. (Original) A method of refrigerating at least one enclosure comprising:

refrigerating at least one interior of the at least one enclosure in a plurality of consecutive modes comprising at least a direct passive mode, an indirect passive mode, a direct active mode and an indirect active mode, wherein the mode of refrigerating is selected at least partially based upon a temperature of a phase change material, and wherein refrigerating the at least one interior in the indirect passive mode comprises:

placing a coolant in a first coolant loop in thermal communication with the at least one interior such that the coolant carries heat away from the at least one interior;

absorbing the heat carried away by the coolant in the first coolant loop, wherein the heat is absorbed by the phase change material;

placing a coolant in a second coolant loop in thermal communication with the phase change material such that the coolant carries away the absorbed heat; and

placing the coolant in the second coolant loop in thermal communication with a cold heat sink such that the cold heat sink absorbs the heat carried by the coolant.

33. (Original) A method according to Claim 32, wherein refrigerating the at least one interior in the direct passive mode comprises:

placing a coolant in the first coolant loop in thermal communication with the at least one interior such that the coolant carries heat away from the at least one interior;

receiving the coolant into the second coolant loop and thereafter placing the coolant in the second coolant loop in thermal communication with the cold heat sink such that the cold heat sink absorbs the heat carried by the coolant, wherein the cold heat sink comprises at least a portion of an aircraft fuselage skin structure.

34. (Original) A method according to Claim 32, wherein refrigerating the at least one interior in the direct active mode comprises:

placing the coolant in the first coolant loop in thermal communication with the at least one interior such that the coolant carries heat away from the at least one interior; and

rejecting the heat carried by the coolant in the first coolant loop to the cold heat sink.

35. (Original) A method according to Claim 34, wherein refrigerating the at least one interior in the indirect active mode comprises:

placing the coolant in the second coolant loop in thermal communication with the phase change material such that the coolant carries away heat from the phase change material; and

rejecting the heat carried by the coolant in the second coolant loop to the cold heat sink.

36. (Original) A method according to Claim 34, wherein refrigerating the at least one interior in the direct active mode comprises:

placing the coolant in the first coolant loop in thermal communication with the at least one interior such that the coolant carries heat away from the at least one interior;

absorbing the heat carried away by the coolant in the first coolant loop, wherein the heat is absorbed by the phase change material; and

expanding a pressurized inert composition into thermal communication with the heat absorbed from the coolant in the first coolant loop such that the inert composition carries away the absorbed heat.

37. (Original) A system for refrigerating at least one enclosure comprising:

at least one air-to-liquid heat pump capable of placing a coolant in a coolant loop in thermal communication with at least one interior of the at least one enclosure such that the at least one air-to-liquid heat pump can reject heat from the at least one interior to the coolant to thereby permit the coolant to carry the heat away from the at least one interior;

a liquid-to-direct heat exchanger capable of receiving the coolant in the coolant loop; and

a cold heat sink in thermal communication with the liquid-to-direct heat exchanger, wherein the cold heat sink is capable of absorbing the heat carried by the coolant received by the

liquid-to-direct heat exchanger, and wherein the cold heat sink comprises at least a portion of an aircraft fuselage skin structure.

38. (Original) A system for refrigerating at least one enclosure at a predetermined rate of cooling, the system comprising:

a heat sink in thermal communication with the at least one enclosure;

at least one air-to-liquid heat exchanger capable of placing a coolant in a first coolant loop in thermal communication with at least one interior of the at least one enclosure via the heat sink such that the coolant can carry heat away from the at least one interior and thereby cool the at least one enclosure at the predetermined rate of cooling; and

at least one air-to-liquid heat pump capable of placing a coolant in a second coolant loop in thermal communication with the at least one interior of the at least one enclosure via the heat sink such that the at least one air-to-liquid heat pump can reject heat from the at least one interior to the coolant to thereby permit the coolant to carry the heat away from the at least one interior and thereby cool the at least one enclosure at the predetermined rate of cooling,

wherein the heat sink has a cooling capacity of less than about 150% of a cooling capacity required for cooling the at least one enclosure at the predetermined rate of cooling.

39. (Original) A system according to claim 38, further comprising a eutectic thermal battery including a phase change material, wherein the eutectic thermal battery is capable of receiving the coolant from each air-to-liquid heat exchanger and air-to-liquid heat pump and thereafter placing the coolant in thermal communication with the phase change material such that the phase change material can absorb the heat carried away by the coolant in the first and second coolant loops.

40. (Original) A system according to claim 38, further comprising:

a liquid-to-direct heat exchanger capable of receiving the coolant in the first and second coolant loops; and

a cold heat sink in thermal communication with the liquid-to-direct heat exchanger, wherein the cold heat sink is capable of absorbing the heat carried by the coolant received by the liquid-to-direct heat exchanger, and wherein the cold heat sink comprises at least a portion of an aircraft fuselage skin structure.